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PHOTOGRAPHY AND ILLUSTRATED PERIODICALS.

BY ELLERSLIE WALLACE.

IT is a gratifying thing to any true lover of photography to see how greatly the modern methods of book and magazine illustration are indebted to the art.

A review of any of the more important monthlies shows fine pictures unmistakably worked up from photographs, while the less pretentious weeklies or dailies in many instances consist almost wholly of work of the same kind only of cheaper quality.

In considering the work of these cheap daily or weekly papers, we cannot be surprised that it is frequently quite poor when regarded from the photographic standpoint. Instantaneous pictures of cricket matches and races, processions, public ceremonies, and the like, have to be taken quickly, and there is seldom or never any possibility of getting rid of objects that are unsightly and detract from the good effect of the work. The choice of a good position for the camera, when working on these public gatherings is always a difficult matter.

But on the other hand, some of the work that is more deliberately done, such for instance as the photographing of buildings in city streets, will show defects of the same kind. Not that the choice of a good position for the camera is so circumscribed as in the former instance, but because numerous things interfere with the obtaining of a clear view no matter where the camera be placed. It may be taken for granted that the

skies in the negatives will always have to be stopped out so as to get rid of the network of telegraph wires and electric cables that are seen everywhere. This, although adding to the labor and expense of preparing the negative for printing, can be tolerated. But how very annoying it is to find that the only available view of a building or street is spoiled by one or more telegraph poles with their big white cross-arms standing right in front of the principal object! Lamp-posts are not so bad, but we can call to mind at least one aggravated case of the kind within a short distance of our office.

Instead of enlarging upon this matter, we wish to suggest a few means for partially rectifying the trouble—we wish we could say for doing away with it entirely.

Every observing photographer has noticed that in taking these architectural subjects, the face of the building may be so lighted as to appear white (or nearly so) or as a map of delicate half-tone, according to the angle at which the sun strikes it. Now, where there are obstructions in the way, it will often be possible to partially conceal them by judicious choice of the light, and finish the matter with comparatively little retouching. Suppose a white-painted pole stood before a rather light colored building, we should force the development of the negative to the verge of chalkiness, and depend upon a few touches of opaque color to fill up the shaded sides of the pole. It would be quite easy to do this so as to defy detection even if the pole was covered with advertisements and lettering. Where such an obstruction stands before a parti-colored object, portions of it may be picked right out of the film with the point of a knife where there are deep shadows in the picture behind, and minute drops of solution of iodine in cyanide of potassium applied to the lighter portions after the film is dry, so as to reduce the deposit and equalize the density.

It will be understood that we do not recommend this for half-tone subjects of any kind, but only for those where the principal object can be made to present brilliant contrasts of light and shade, so that the hand work on the negative may be effectually and easily masked or lost in the bold relief of the subject.

There have been some lucky hits in architectural photography made by our Philadelphia photographers in this way: certain buildings having been always too closely surrounded by others to give a good view, the photographers have ascertained when the surrounding structures were going to be torn down, and in the short time elapsing before the new buildings were too high, they have succeeded in getting good views across the empty space. A noteworthy example of this is the famous "Carpenter's Hall" near Fourth and Chestnut streets, where the Continental Congress held its sessions.

In street photography, much can be done by getting a well-elevated position for the camera. The London photographers often have a four-wheeled cab with a flat roof on which the tripod is erected, and an arrangement for locking the springs of the vehicle so as to insure steadiness. The spikes in the bottom of the tripod legs are then "shoed" with cork or india-rubber to prevent slipping. Another plan often resorted to, is a light skeleton step-ladder to fill the place of the tripod, standing say from nine to twelve feet above the pavement.

We take for granted that when work of any importance of this kind is attempted, the exposures will not be always instantaneous. Now an exposure of even a single second upon a crowded street will inevitably give a negative more or less streaky in the foreground on account of the moving objects. This is very unsightly in the print, and the trouble may be entirely rectified by giving the plate a *long exposure* so that the passing crowds may leave no marks on the negative. We may add in this connection, that we possess a number of street views made in the cities of continental Europe before the introduction of the rapid modern plates or films. The exposures often ran up to several minutes and the streets appear perfectly empty and clear. We have very often been asked how it was that there were none of the inhabitants visible in the photograph, and how we had managed to find the streets deserted. Long exposures on our rapid plates now-a-days would probably necessitate the using of an orthochromatic yellow screen, or adding a large amount of restrainer to the developer, as well as a very small stop in the lens.

The stopping out of skies in negatives of this kind is generally an easy matter, and may be quickly done by following the sky line of the houses with a small brush charged with opaque color. When this is done, cut a piece of spoiled sensitive paper to fit, and paste it by its reverse side on the back of the negative, filling in any intervals with the color. This plan is neater and more quickly done than covering the whole film with color, besides being more durable. Albumenized paper when blackened by light is absolutely opaque, which is not the case with many of the commercial black papers.

"REALISTIC PHOTOGRAPHY."

XANTHUS SMITH.

WE acknowledge with great pleasure the receipt from Mr. P. H. Emerson of a folio containing ten of his East Anglican pictures. They have furnished us a great treat and a number of artists as well, to whom we have shown them—for recognizing as we painters do, that there are certain shortcomings, chiefly in the composition, yet there is so much art and truth in the pictures that to a true lover of nature there is a vast deal to gratify in them. We see in every one that the utmost has been done that could, to lift the work out of mere common-place photography. Selection of subject with a view to sentiment, grouping, action and general harmony of purpose have been well attained indeed for photography. The absence of accentuation of focus gives an effect of mystery in some and an effect of breadth of touch in others that is pleasing to an artist. We must say, opposed as we are to attempting to lift photography into the realms of high art, that we regret that Mr. Emerson should have been lead to renounce his good work. For if it does not meet the expectations or requirements of many learned artists, it is surely very instructing and encouraging for a large number, who have not been favored with a sufficient share of the divine efflatus to be great painters, to be able to gratify themselves in this humbler walk of art.

Temperaments are so different that it is impossible to lead every one in the same direction, and the wide-spread practice of photography and employment of photo-processes, is so popularizing art that a thousand are dabbling in the subject today to one that was doing so twenty-five years ago, and consequently it is impossible to narrow the subject down to a few accepted rules. Originality in art has always been considered a high quality, and if we see a dozen different individuals striking out in as many different directions, and having their admirers and adherents we would say let them travel their different roads, enjoying what they may, and as fully as they may, the beauties of art and of nature in conformity with their particular organizations.

We think it is folly for the adherents to and opposers of Mr. Emerson's views to be at war with each other. Amongst our photographic acquaintances, we all have friends widely differing in their mode of looking at photographic work, and who derive pleasure from very different qualities. One who is keen of sight and fond of mechanical exactness sees things in an entirely different manner from another who is not gifted with such sharpness of vision and delights more in broad contrasts. If we show the former some prints of agreeable composition in fine effects of light and shadow, which are defective in technical work, he will see nothing in them but subject for criticism. It will be in vain that you point out their artistic merits. He will say "But they are not sharp." "You should have had such or such a lens" or "they are over-timed," "over-printed," "over-toned" or a half a dozen other things. He leaves us and we are mutually disappointed. Then in drops our broader-sighted friend. We show the same prints to him and he is delighted with them. Under the influence of the interview we have just had, we begin to apologize for the want of excellence of the mechanical work. "What is the difference" he tells us. "Any one may focus sharply, or print, or tone, or burnish to perfection, but how many would have made such choice of subject and secured such lighting." Let us then in practicing amateur photography, which is not a matter of "bread and butter" business, look broadly upon the subject, and we will not only thereby increase our gratification but our work will prove more instructive and more useful to us.

PHOTO-MICROGRAPHIC ATLAS.

M. LANDE has shown the useful and curious application of photography that has been made in the hospital of La Salpetriere, in the practice of Prof. Charcot, namely, photo-micrographic reproductions of the medulla in divers pathological states. Thanks to the sections cleverly prepared and carefully photographed lesions of the medulla characterizing certain affections—for example, that of ataxia—are well indicated. In a manner, all the transformations which the different zones of the medulla undergo, according to the nature of the malady to which they are subjected, may be followed. This is a convincing proof of the immense service that photography can perform—in pathological research.

THE FIRST PORTABLE CAMERA.

JULIUS F. SACHSE.

THE Portable Photographic outfits of to-day in their multitudious variations are usually classed among the peculiar institutions incident to the closing decades of this the XIX century, and consequently are justly ranked beside the Telephone and other Electrical and Mechanical wonders of the present period. In view of this universal opinion, the subjoined fac-simile extract from an old tome in our possession will no doubt be somewhat of a surprise.

In a previous volume (Am. Jour. of Photo. Vol. x, 1889, pp. 327 et seq.) we gave an extract and illustrations from Baptista Porta and his camera of 1589, and then thought we had exhausted the subject. In this, however, we were mistaken. In shifting a portion of our library during the present month we found upon an upper shelf among a number of old and neglected books upon Philosophy and kindred subjects, a copy of "*Philosophical* | EXPERIMENTS | and | OBSERVATIONS | Of the late Eminent | DR. ROBERT HOOKE | S. R. S. | And Geom. Prof. *Gresh* | and | Other Eminent VIRTUOSO's in his Time | *with* COPPER PLATES | Published by W. DERHAM, F. R. S.—

LONDON. | Printed by W. and J. Innys, Printers to the | ROYAL SOCIETY, at the West End of ST. PAUL'S. | MCCCXXVI | .

After brushing off the accumulated dust of years, while listlessly turning over the pages prior to replacing upon the shelf, we came across the chapter and illustration here reproduced, which without doubt is the first description and illustration of what was virtually a hand camera. It is true there was no sensitive dry plate, film, roll holder or button arrangement, which are all so important features at the present stage of Photographic development, nor was there even a thought of the possibility of permanently impressing the image as seen upon the translucent Medium used in this crude apparatus, still it was practical so far as it went, and the scheme when presented before the Royal Society was without doubt as great a wonder, as some of the intricate inventions presented at the present day.

An Inſtrument of Uſe to take the Draught, or Picture of any Thing Communicated by Dr. HOOK *to the* Royal Society, Dec. 19, 1694.

AMONG the Inſtruments that may be of Uſe to curious Navigators and Travellers, one is, for procuring the Pictures, Draughts, or true Forms and Shapes of ſuch Things as are, or may be, taken Notice of by them; that is, not only of the Proſpects of Countries, and Coaſts, as they appear at Sea from ſeveral Diſtances, and ſeveral Poſitions; but of divers In-land Proſpects of Countries, Hills, Towns, Houſes, Caſtles, and the like; as alſo of any Kind of Trees, Plants, Animals, whether Birds, Beaſts, Fiſhes, Inſects; nay, of Men, Habits, Faſhions, Behaviours; as alſo, of all Variety of Artificial Things, as, Utenſils,

ſils, Inſtruments, Engines, Ships, Boats, Carriages, Weapons of War, and any other Thing of which an accurate Repreſentation, and Explanation, is deſirable. For, tho' a Deſcription in Words may give us ſome imperfect Conception, and Idea, of the Thing ſo deſcrib'd; yet no Deſcription, by Words, can give us ſo full a Repreſention of the true Form of the Thing deſcrib'd, as a Draught, or Delineation of the ſame upon Paper. Nor can we ſo perfectly conceive, or imagine, the true Colours, by Words, as by ſeeing the very Colour it ſelf imitated and compared with the Life, or the real Thing: Whence we find how imperfectly the Colours of Plants are repreſented by Herbals, which are waſh'd, or colour'd, only from the Deſcriptions which are made of thoſe Colours in the Books.

Now, though this be not a new Deſign, or a Thing that has never been done before by any that have given us Accounts of their Travels; yet, if we do but conſider, how the moſt of thoſe have been done, it will, I conceive, make this, which I propound for this Effect, ſo much the more valuable. 'Tis well known, that the Books commonly made for the Uſe of Seamen, (now commonly called *Wagoners*, becauſe one *Wagoner* printed a Collection of many ſuch Obſervations) that theſe Books, I ſay, are full of the Proſpects of Countries, as they are ſaid to appear upon the Sea, at ſuch Diſtances and in ſuch Poſitions: And I lately ſaw a Book containing the Proſpects of all the Weſtern Coaſts of *America*; but any one, that underſtands Proſpect, will eaſily diſcern, how rude, imperfect, and falſe a Repreſentation, all ſuch Books contain of the Places themſelves: For, not to mention the Impoſſibilities they often repreſent, as the Over-hanging of Mountains for half a Mile, or a Mile, which, tho' the Mountain were

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made of caſt Iron, were impoſſible to be ſuſtain'd in ſuch a Poſture: The extravagant Heights they generally raiſe the Hills to, and the ſudden and very decline Deſcents they make them have into the Vallies, do plainly enough demonſtrate them to be no true Repreſentations of what they are deſign'd for. And, indeed, they are moſt made by the Hands of the Mariners, who are, generally, very little skill'd in the Art of Delineation; and, therefore, 'tis not to be expected that they ſhould be very exact: However, even theſe are of very good Uſe for Navigators; and they furniſh them with a better Idea of the Appearance to be look'd for, than Deſcriptions by many Words would inform them. Again, we find that many Relations of foreign Countries do give us Pictures of Towns, Proſpects, People, Actions, Plants, Animals, and the like; and thoſe beget in us Ideas of Things, as they are there repreſented. But, if we enquire after the true Authors of thoſe Repreſentations, for the Generality of them, we ſhall find them to be nothing elſe but ſome Picture-drawer, or Engraver, here at Home, who knows no more the Truth of the Things to be repreſented, than any other Perſon, that can read the Story, could fancy of himſelf, without that Help. Such are all the Pictures in the Books of *Theodore de Brie*, concerning the *Eaſt* and *Weſt-Indies*: Such are alſo the greateſt Part of the Pictures in Sir *Thomas Herbert*'s Travels; and thoſe of Mr. *Ogylby*'s *Aſia*, *Africa*, and *America*; which are Copies of the *Dutch* Originals, and are, originally, nothing but Mr. Engraver's Fancy: So that inſtead of giving us a true Idea, they miſguide our Imagination, and lead us into Error, by obtruding upon us the Imaginations of a Perſon, poſſibly, more ignorant than our ſelves.

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IT is, therefore, the Intereſt of all ſuch, as deſire to be rightly and truly informed for the future, to promote the Uſe and Practice of ſome ſuch Contrivance as I ſhall now deſcribe; whereby any Perſon that can but uſe his Pen, and trace the Profile of what he ſees ready drawn for him, ſhall be able to give us the true Draught of whatever he ſees before him, that continues ſo long Time in the ſame Poſture, as while he can nimbly run over, with his Pen, the Boundaries, or Out-Lines of the Thing to be repreſented; which

being once truly taken, 'twill not at all be difficult to add the proper Shadows and Light pertinent thereunto. By the ſame Inſtrument alſo, the Mariner may very eaſily and truly draw the Pro-

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ſpect of any Shore, and from Time to Time denote the Riſing thereof, as he does nearer and nearer approach it, and the Depreſſion, or Sinking of it, as he does recede.

THE Inſtrument I mean for this Purpoſe, is nothing elſe but a ſmall Picture-Box, much like that which I long ſince ſhewed the *Society* for Drawing the Picture of a Man, or the like; of the Bigneſs of the Original, or of any proportionable Bigneſs that ſhould be deſired, as well bigger as ſmaller, than the Life; which, I believe, was the firſt of that Kind which was ever made, or deſcribed by any. And, poſſibly, this may be the firſt of this Kind, that has been applied to this Uſe; tho', upon the firſt Inſtitution of the Royal Foundation of *Chriſt-Church*, I propounded it to the Governors there, for the Uſe of the Children: But Sir *Jon. More* undertaking to write an Inſtitution, and having omitted it, it has not been there brought into Uſe.

Stolen Lenses.—A short time ago Detective Sergeants Slawson and O'Connor, of the Central office, in New York, saw a young man go into a photographic store on Fourth Avenue, Saturday night, and offer to sell a sixty dollar lens for three dollars. The proprietor would not buy the lens unless the young man could bring some one to identify him. The young man went down Fourth Avenue and met several companions. The detectives arrested them all.

William Smith, 16 years old, was the lad who offered the lens for sale. His companions were Charles Schultz, 17 years old, and Harry Edwards, 17 years old, the two first named living in Philadelphia, and Edwards living at No, 18 Jay street, this city. Schultz had two lenses in his pocket, Edwards had two and Smith had three. They were remanded from the Jefferson Market Court to police headquarters for trial.

MODERN ASTRONOMY.

DR. HUGGINS, F. R. S. the eminent astronomer and president of the British Association, at the late meeting at Cardiff, paid a graceful and well-deserved compliment to Photography in his address "Modern Astronomy." Mr. R. S. Ball in reviewing this address in the *Contemporary Review* for September, makes the following allusions to Photography, viz.:—

At the present moment the attention of the astronomical world is especially directed towards the development of the resources of photography in the various applications which it has to their art. Already the camera has become an indispensable adjunct in the observatory, and we are every day learning more and more of what it can do for us. The chemical eye is often more sensitive than the human eye; it is always more patient. It will display for us a magnificent nebula like that which surrounds the Pleiades, and which is wholly invisible to the unaided eye, and only to be seen with the telescope under very special conditions not often realized. Naturally, Dr. Huggins has much to tell us of the applications of photography. It would be impossible for him not to have mentioned that remarkable photograph obtained by Mr. Roberts of the great nebula in Andromeda, which was produced by exposing a highly sensitive plate for four hours in the focus of a powerful reflector. The result has been to produce a picture which has been said, and I believe with truth, to be the most suggestive representation of any celestial object that has ever been obtained. Features which had been dimly traced in the nebula when visually examined in powerful telescopes are now seen to be parts of an organic whole visible on the photograph, though not otherwise discernible by the keenest sense. Such a study of the great nebula was all the more acceptable because it is one of the most baffling of these objects. It is bright enough to be perceived by the unaided eye, and it might have been expected that so striking a celestial structure ought by this time to have disclosed its character either as a distinct cluster of stars, or as a truly gaseous

object. Herschel long ago called it one of the least resolvable of the nebulæ, but yet it does not appear to possess a spectrum similar to that of the gaseous nebula of which we have been speaking. The character of this object, both as to its actual physical nature and as to the materials present in it, is at present undetermined. This consideration lends a certain amount of mystery to Mr. Roberts' great photograph, a mystery we do not feel to a corresponding extent when we look at the photograph of Andromeda's only rival, the great nebula in Orion. The pictures of the latter exhibits a glorious object which is certainly known to be gaseous, and we have also the assurance that hydrogen is among the materials of which it is composed.

There is no part of Dr. Huggins' address more interesting than that which treats of the exquisite application of the spectroscope to the discovery of the movement of approach or movement of recession in the object from which the light emanates. In fact, there is no passage in the address which seems to me more pregnant in significance than in which we are told that: "In the future a higher value may indeed be placed upon this indirect use of the spectroscope than upon its chemical revelations." It seems that the spectroscope promises to prove a useful, indeed an essential, ally to those older and more familiar parts of astronomy in which the movements of the heavenly bodies were the study chiefly contemplated. The spectroscope here tells us exactly that element in the movement which the older methods of inquiry entirely failed to reveal. A star coming directly towards us or retreating directly from us appears to stand still. With our micrometers and meridian circles we can measure those movements of the celestial bodies which lie athwart the line of sight; but these appliances were useless in so far as movements along the line of sight was concerned. Here it is that the spectroscope comes to our assistance, and what was at first dreamed of as a mere theoretical possibility has now become by gradual improvement in the construction of the instruments a most valuable and indispensable mode of research. As to the accuracy of this method, it enables us, under favorable circum-

stances, to measure speed of recession or approach "to within a mile per second, or even less." What this means is that such a speed as that of the revolution of the earth in its orbit around the sun could be determined to within five or six per cent. of its amount. It is to Dr. Huggins himself that we are indebted for the first application of this principle to astronomical measurement. The earliest observations were made by him in 1868, but for many years the application of this method was retarded by a want of perfection in the instruments necessary for so delicate a branch of research. However, such improvements have been made within the last two years, by means of photography at Potsdam, and by eye observations at the Lick Observatory, that the method has been elevated to a precision that entitles its measurements to the respect which has always been accorded to those made by the appliances of the older astronomy.

Professor Vogel at Potsdam photographs a small part of the spectrum of the star in the vicinity of the line G, and for the purpose of comparison introduces with all needful precaution the hydrogen line in that neighborhood. For certain stars he has recently used some of the lines of iron. The result we must give in Dr. Huggins' own words: "The perfection of these spectra is shown by the large number of the lines, no fewer than 250 in the case of Capella, within the small region of the spectrum on the plate. Already the motions of about fifty stars have been measured with an accuracy, in the case of the larger number of them, of about an English mile per second."

In a method of such delicacy, involving results of so great interest, it is obviously desirable to have confirmatory measures made under circumstances as widely different as possible. These have been forthcoming from the Lick Observatory in California, thanks to Mr. Keeler, than an astronomer at that great institution. He has succeeded in obtaining determinations, by direct eye observation with superb instruments, and he has found it possible to execute measurements of a spectrum with an accuracy as great as that obtained by Professor

Vogel. The result is so significant that we must again give it in the words of Dr. Huggins:

"The marvellous accuracy attainable in Mr. Keeler's hands on a suitable star is shown by observations on three nights of the star Arcturus, the largest divergence of Mr. Keeler's measures being not greater than six-tenths of a mile per second, while the mean of three nights' work agreed with the mean of five photographic determinations of the same star at Potsdam to within one-tenth of an English mile. These are determinations of the motions of a sun so stupendously remote, that even the method of parallax practically fails to fathom the depth of intervening space, and by means of light waves, which have been, according to Elkin's nominal parallax, nearly 200 years upon their journey."

It is impossible for any lover of astronomy to read of these achievements without some emotion. The alliance between photography and spectroscopy is here rendered available for extending our knowledge of the movements of the heavenly bodies in a direction wholly inaccessible to every other appliance of the astronomer. I may mention one of the points in which the importance of the new method can hardly be overrated. In the older process of ascertaining the proper motions of stars, the lapse of long periods of time was indispensable. A star would have to possess a movement more rapid than that of any of the stars, except a very few, if it could be determined by our meridian instruments in less than a twelvemonth. In the majority of cases an interval of many years would be necessary before the movement of the star could be certainly concluded from such measurements. With such small movements as those possessed by most of the stars, various causes combine to render the measurements highly uncertain; and yet for astronomers who desire to learn the constitution of the heavens, there would be no information more valuable than copious and accurate knowledge of the proper motions of the stars. It seems from these discoveries at Potsdam and at Lick that we may now entertain a hope that abundant and accurate information of the character that I have indicated will be promptly forthcoming.

The researches of Mr. Keeler at Lick have already afforded us some information with regard to the proper motions of the nebulæ in the line of sight. Here, indeed, an entirely new departure has been made. Most of these objects are so ill-defined that their position cannot be measured, or cannot by ordinary methods be even specified with the accuracy necessary for the determination of their proper motions. The vagueness of the nebula is not, however, a bar to the application of the spectroscope in the measurement of its movements in the line of sight. We still know nothing as to the movements of the nebula athwart that line. But it is something for us to have obtained information as to the progress of these bodies in one direction at all events. An attempt was made to solve this problem a good many years ago by Dr. Huggins himself; but the apparatus that was then available did not possess the refinement necessary for measurements so delicate. The resources of the splendid equipment at Lick have provided what is required, and Mr. Keeler has ascertained the movements of some nebulæ. As an illustration of his results, we may take the famous nebula in Orion. He finds that this object is retreating from our system at the rate of about ten miles a second. The most rapid movement he has yet discovered in one of these nebulous objects is a pace of forty miles a second.

Among the problems which the spectroscope has as yet failed to solve must be mentioned that of the Aurora Borealis. No doubt something has been learned; but still it must be confessed that the prism has been more successful up to the present in its application to objects which lie like the nebulæ on the very confines of the visible universe, than it has to the aurora which is, comparatively speaking, close at hand. Dr. Huggins gives us a summary of our knowledge on this subject. It is certain that the glow of the aurora is in the main due to the effect of electric discharges in the upper regions of the atmosphere. Seeing that we are familiar with the spectra of the atmospheric gases, as produced in our laboratories, it might have been expected that the interpretation of the spectrum of the aurora would be a comparatively easy task. We

are still ignorant of the source of the principal line in the green which, as Dr. Huggins remarks, may have an origin independent of that of the other lines. He also refers to the supposition that the aurora is produced by the dust of meteors; but with reference to this, he notes that experiment has shown that fine metallic dust suspended in gases conveying an electric discharge like that of an aurora will not cause the spectrum to exhibit the characteristic line of the metallic dust in question. There is much to be said for Professor Schuster's suggestion that the principal line in the aurora may be due to some extremely light gas which is present in too small a relative quantity in the lower strata of the atmosphere to permit of its existence being disclosed by spectroscopic or any other form of chemical analysis. In the upper regions where the auroral displays take place, the ordinary gases have assumed extreme tenuity, and the lighter gas becomes of more relative importance, and gives a character to the spectrum.

As it is instructive to learn as far as may be the boundary between the known and the unknown, it is interesting to read what Dr. Huggins has to tell us about the solar-corona. The nature of this marvellous appendage to the sun is still a matter of uncertainty. There can, however, be no doubt that the corona consists of highly attenuated matter driven outward from the sun by some repulsive force, and it is also clear that if this force be not electric it must at least be something of a very kindred character. Dr. Schuster suggests that there may be an electric connection between the sun and the planets. In fact, with some limitations we might even assert there *must* be such a connection. It is well known that great outbreaks on the sun have been immediately followed, I might almost say, accompanied by remarkable magnetic disturbances on the earth. The instances that are recorded of this connection are altogether too remarkable to be set aside as mere coincidences. Dr. Huggins does not refer in this connection to Hertz's astonishing discoveries; but it seems quite possible that research along this line may throw much light upon the subject, at present so obscure, of the electric relation between the sun and the earth. So far as the spectrum of the corona is concerned,

we may summarize what is known in the words of Dr. Huggins: "The green coronal line has no known representative in terrestrial substances, nor has Schuster been able to recognize any of our elements in the other lines of the corona."

Dr. Huggins notes that it is a little surprising that our first accurate knowledge of the spectrum of hydrogen should have been ascertained not from a course of refined laboratory experiments, but from photographs of the spectra of the white stars to which Sirius belongs. Hydrogen has a few visible lines in its spectrum, and the photograph shows that these belong to an organized system of lines which are wonderfully displayed in the spectra of the white stars, first fully obtained by Dr. Huggins. The hydrogen spectrum possesses a special interest, inasmuch as Dr. Johnstone Stoney many years ago pointed out that the three principal visual lines were members of a harmonic series, and the interesting discovery has been since made by Professor Balmer that a more comprehensive law includes both these harmonic members and the rest of the series. Thus the hydrogen spectrum appears to present a simplicity not found in the spectrum of any other gas, and therefore it is with great interest that we examine the spectra of the white stars, in which the dark lines of hydrogen are usually strong and broad. In stars of this class we often look in vain for those dark metallic lines so characteristic of other stars which have a nature more nearly resembling our sun.

The question is also discussed as to whether the radiance characteristic of the white stars may be regarded as an indication of an extremely high temperature as compared with that shown by other stars. It seems hardly possible to doubt that such a star as Sirius owes its great lustre not merely to its size, but also to its intrinsic brilliancy, indicative of a high temperature. It may illustrate the attention that has been paid to the spectra of the white stars to refer to some interesting observations of Scheiner; he has found that the objects of this class which are in the constellation of Orion agree in possessing a certain dark line, which appears to coincide in position with one of the bright lines in the famous nebula in the same constellation. He remarks that, with the single exception of

Algol, he has not observed this same line in any other white star. These observations naturally suggest the remark that the stars in the constellation of Orion possess a certain affinity beyond that implied by their proximity in the same constellation. They are apparently a group associated by community of composition. In considering this circumstance we are reminded how the great nebula, with every increase of optical power and every increase in the period of exposure of the photographs, seems to cover an ever-widening area, extending, as we now know, so as to include several of the bright stars.

So far the spectroscopic results that we have referred to may be mainly traced in one way or another to the initiation of Dr. Huggins himself. He has described in his address another most recent branch of spectroscopic work which can hardly be said to have been sought for in his own labors. However, it takes its rise from the measurement by the spectroscope of movement in the line of sight, for the application of which method we are indebted to him. It is well known that one test of the power of a great telescope is usually expressed by the closeness of the double stars which it is able to separate. The finest instrument on the top of Mount Hamilton, even when the eye of a Burnham is applied to it, will only succeed in decomposing a binary star into its distinct elements when the components are separated by an angular distance of at least some tenths of a second. The most sanguine telescopic observer never expected that he would be able to separate the light from two stars if they were less than the tenth of a second apart; yet the spectroscope is able to distinguish the distinct existence of stars which are separated by an interval not greater than the two-hundredth part of a second. How small this angle is, may be realized by observing that it is about equal to that subtended by a foot-rule at a distance equal to the diameter of the earth. It is to Professor Pickering, at Harvard College Observatory, that we are indebted for the application of this most beautiful process. The K line in the photograph of Mizar was found to be double at intervals of fifty-two days; the spectrum was thus not due to a single source, but

could be completely explained if the star was an excessively close double, the components of which moved periodically in the opposite directions in the line of sight. It is hard to overestimate the interest derived from the information conveyed by such photographs. The period of the openings of the lines gives us the period of revolution of the binary star. The actual distance by which the line is opened will give us, at all events in some cases, the velocity of the star, and thus its distance may be learned, while when the distance and the periodic times are known the masses become determined. It seems hardly an exaggeration to say that we are actually able to weigh some stars by the spectroscope.

It was only natural that Algol should invite the attention of those provided with the appliances necessary for this new research. It now seems that the mystery of the demon star has been expounded by the spectroscope. It consists of two components, the large bright star twice as big as the sun and about half as heavy, attended by a dark star of about half its own size and mass. The two are 2¾ million miles apart, and the dark or nearly dark companion, by rapidly revolving round the brilliant star, periodically intercepts its light, and thus gives rise to the well-known variability of Algol. Still one more application of the spectroscopic method of measuring movements in the line of sight is found in Dunér's beautiful observations of the limb of the sun. By comparison between the approaching edge and the retreating edge he has been able to ascertain the velocity of the sun's rotation. It is not only interesting to find that these results corroborate the determinations already familiar by observations of the sunspots, but the spectroscopic method admits of being applied to zones in the sun from which spots are absent. We thus obtain a very complete knowledge of the laws of rotation of our luminary. Dunér's measurements confirm the extraordinary fact that the equatorial regions in the sun accomplish a revolution in a shorter time than zones which are nearer to his poles.

The address of course gives us some account of the present state of the combined effort to produce a great photographic chart of the heavens. About 22,000 photographs would be nec-

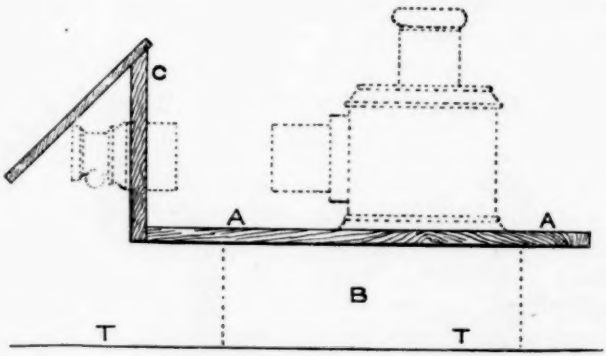
essary, each covering a space of four degrees. Each star is to appear on two plates, so as to avoid errors, and by giving an exposure equivalent to forty minutes at Paris, it is expected that all stars down to the fourteenth magnitude will be represented. Astronomers well know how large a share of credit is due to Dr. Gill in connection with this great work. This vast surveying task is only one of the pieces of astronomical work in which photographing the stars is now employed. In the delicate movements of annual parallax it has been proved, especially by the labors of Professor Pritchard at Oxford, that measurements made on the photographs can compare favorably with the finest measurements made on the heavens. We are only just beginning to realize the benefits from these photographic processes.

A NEW USE FOR THE OPTICAL LANTERN.

T. C. HEPWORTH, F. C. S.

WITH the increase of schools of art all over the country a knowledge of drawing has become far more common among us than it was twenty or thirty years ago. This is indeed a subject for congratulation, for the practice of art, different from many other pursuits, confers benefit and pleasure upon others besides its professor. Since, too, the invention of several photo-mechanical processes by which drawings can be readily transformed into typographic blocks without the intervention of the engraver, there has been a demand for drawings in black and white such as never existed before; so that all around us we see schools arising which profess to devote themselves to the new branch of graphic art, and pupils eagerly availing themselves of the proffered instruction. We think, then, that any means which promises a still closer union between the photographer and the draughtsman, and which may tempt the latter to adopt the pencil of the former, cannot fail to have an influence for good. Such a means we wish now to place before our readers, and, although we cannot claim any great originality for the suggestion, we may at least say that it is a new application of an old idea.

It came about in this way. Some time ago we were wishful to obtain some photo-mechanical blocks from certain lantern slides we had at hand. The half-tone processes of the Meisenbach type were obviously out of the question, for the printing had to be done on a quick rotary machine. It was therefore determined that they should be drawn in line on card in the blackest of inks, photographed, transferred to zinc, and etched in the usual manner. But when we came to make the necessary enlarged drawings from the slides, we found that the work was extremely slow and laborious, although we employed proportional compasses and other labor-saving devices. It was then suggested that the slides should be sev-



erally placed in a lantern, and that the resulting enlarged image, received upon a piece of card, should be outlined direct in pencil. This we did, but found the work extremely fatiguing, for the cardboard upon which we pencilled the new lines was necessarily in strictly vertical position, and the attitude assumed was so cramped that a frequent rest was demanded.

It was now suggested that things might be much improved if the enlarged image, instead of being projected horizontally, were thrown down upon a table, at which the worker might sit with some degree of comfort. The hint was quickly acted on, and by the same evening we had constructed a rough and ready enlarging apparatus for draughtsmen, which has since been constantly in use, and which we would not readily part

with. It is simply an application of the *camera lucida* principle, which has so long been in use for the drawing of microscopic objects, to the ordinary mineral oil optical lantern, only that, instead of using a prism, we make use of a common mirror.

The apparatus consists of a base-board about seven inches in width, with a ledge at each side, leaving in the centre sufficient space for the lantern to be moved to and fro, while at the same time the ledges cause the image cast to be always central. But the relation of parts will be best understood by reference to the accompanying sectional drawing.

AA is the base-board, made out of inch deal, with a ledge on each side as already stated. It is about seven inches in width and three feet in length, and while in use it is supported on a (lantern) box, B, laid on its side on the table, TT. At one end of this base-board is an upright, C, of the same width (seven inches), pierced in the centre with a four-inch hole so as to carry the front of the lens tube, which is separated from the lantern body by a space which varies with the amount of enlargement or reduction which may be required. At the top, this vertical board is bevelled to an angle of 45°, and by means of wooden buttons a piece of looking-glass, face downwards, is fixed at that angle. This glass is large enough to cover the lens front, so that the image of the picture on the stage is intercepted and cast upon the table below, upon which a sheet of cardboard is placed to receive it. A piece of ordinary looking-glass is employed—in our case we actually use a hand toilet-glass—and although theoretically such a glass, not silvered on the surface, should cast a double image, in practice it is found that no secondary image is perceptible. Indeed, so free is the reflection given from this difficulty that the arrangement might with advantage be employed for making reversed negatives.

A lantern can be used in this way by daylight provided that the window-blind is pulled down, so that the picture thrown upon the cardboard is not eclipsed by the brighter light. There is, indeed, an advantage in working under such conditions, for the lines of the picture may be traced over in pencil,

while, at the same time, the artist can watch the growth of his own work. There is also an advantage in shutting off the lantern light every now and then, so that progress may be reported the more effectually. It is obvious that the lantern employed in this way will give a reduced image as well as one which is larger than the original. But, in this case, it will be found necessary either to reduce the size of the support upon which the base-board stands, or to raise the cardboard upon which the image is cast. The apparatus as shown is, of course, but a makeshift, and a far more perfect contrivance can be readily constructed by anyone with a little ingenuity in his composition. Such an improved instrument would include a mechanical movement for altering the height of the lantern, as well as a rack-work for moving it from and towards the front lens. There are many other points which will doubtless be suggested by those who care to give time and thought to the matter. We place the idea before our readers in a roughly hewn state, and will leave them to cut down its angles and polish it up generally according to their individual tastes.

We need hardly point out that with a more powerful source of light— such as the oxyhydrogen light—the lantern can be used for tracing pictures of far larger size. In this form it should be most useful to artists for making rough sketches upon canvas or paper. We have also often suggested that scene-painters should call in its aid to help them in sketching out their designs in charcoal, instead of squaring both drawing and canvas in the usual manner. Messrs. Perken, Son & Rayment are about to bring out a lantern sketching arrangements on the lines indicated in this article.—*The Photographic News.*

SQUILLSBY, who works in a photographic studio, popped the question successfully the other night, after which he remarked:—

"And now, I suppose, you will allow me to take a kiss?"

"Why, of course," she replied, "it would be in good taste now."

"Very well," said Squillsby, "turn your head a little to the right, fix your eyes on that picture there—so—that's it—smile just a little—wink as often as you please—there—now the operation commences."

—*Truth.*

THE AIMS OF ARTISTIC PHOTOGRAPHY.

ERNEST J. HUMPHERY, M. A.

A FEW short years ago any one who spoke of the possibility of photography taking its place among the pictorial arts would have been looked upon as a visionary and a dreamer of idle dreams; but so great are the strides which have been made in the advance of the pictorial side of photography that the dream seems now on a fair way to become a reality.

The known processes of photographic reproduction of those days had more to do with the small estimation in which photography was held by all men of artistic feeling than any want of technical skill on the part of those who practiced the art, if art it could be called.

But now, thanks to more perfect methods of reproduction, we are enabled to obtain pictures which give relatively true values, and in which the effects of light and shade can be reproduced with very great exactitude. The greatest danger against which we have to guard is that, having progressed so far, we may imagine that we have attained the goal of our ambition. Let us never be satisfied with that which has been accomplished, but ever struggle onwards to what may appear to be the unattainable; and as we progress so will new possibilities open out to our view, new vistas of the infinite beauties of art.

Another great hindrance to the advance of our art is the ease with which a certain excellence of manipulation may be attained, which induces many to think that they can master the art in a few months, merely because they are able to produce work which flatters their own vanity and gives a certain amount of pleasure to their friends. Nothing that is worthy of the name of Art can be attained save by careful study, hard work and proper guidance, combined with a liberal education and an absolute determination to overcome every difficulty. Though it may be true that "*Poeta nascitur non fit*," this is by no means true of the artist; the poetry of his art may be born in him, but nothing but the most careful training can direct this

poetic conception in the right path. He must spend years of his life in the Art Schools of London, Paris or Rome, and live amongst the works of the old masters, the giants of art, before he can hope to gain even the first step on the ladder which is to lead him ever onward and upward.

It may be that few of us can devote the years of patient study and untiring work which are necessary to those who would attain real excellence; but much may be done by a careful and earnest study of the works of the old masters, which are open to all who care to devote a few hours a week to real and diligent study under proper guidance of the masterpieces which adorn the walls of our own National Gallery.

There are surely few of us who cannot number an artist amongst our friends; and any artist who sees that we are truly and really anxious to attain a knowledge of art, will spare some little time to point out to us what to study and what to avoid, for we learn as much from that which is to be avoided as from that which most nearly approaches perfection. Perfection in art is, of course, impossible to man; but we must strive to approach as nearly as is possible to the unattainable.

We shall find that excellence is neither the prerogative of one master nor of one school; but that each has its own beauties, each its own lesson, for those who care to learn.

This is a lesson which must be brought home most strongly at the present moment to those who are aiming at the artistic in photography. There are at present practically two schools —the old-fashioned photographer who makes everything as sharp and microscopically full of detail as the lens will render it; the other which rushes to the opposite extreme, and to whom detail is "*αναθεμα μαρανα θα*," and who seeks to attain their object by throwing the lens out of focus, or in some cases doing away with the lens, and using a pinhole in its place.

Let us deal with the sharp-focus school—the school to whom detail is as the breath of life. Can they be said to depict Nature? or do they not rather, by their exaggerated straining after truth, simply distort Nature, and depict her as no eye can see her? We do not wish to study the beauties of Nature with an opera-glass, or even with a microscope. This may

suit the *savant* and the man of science; but it is not art, nor any approach to art. Nature is never seen thus by the eye, and in art we must render Nature as the eye sees, as faithfully and as truly as we can; but not more truly than the unaided eye of man can see.

Remembering that our art is for the eyes of men, not flies, Nature has given us powers of vision suited to our state; and we wish to see no more than Nature enables us to see. The Words of Pope, in his "Essay on Man," says so much in a few lines on this subject that I cannot do better than quote them:

> "Why has not Man a microscopic eye?
> For this plain reason—Man is not a Fly.
> Say what the use, were finer optics given,
> T' inspect a mite, not comprehend the heaven."

And bearing this in mind, let us try to reproduce Nature as we see her, not as she may appear to the fly; and remember that the broad truths which are revealed to our eyes are those which alone concern our art.

> "First follow Nature, and your judgment frame
> By her just standard, which is still the same;
> Unerring Nature, still Divinely bright,
> One clear, unchanged and universal light;
> Life, force and beauty, must to all impart
> At once the source, and end, and aim of Art."

And now to consider what it is that we do see in Nature, for that is the main point. Take for instance, the most beautiful thing in Nature—a beautiful woman. What do we see when we gaze upon her? A face divinely fair. Our eyes rest in perfect peace and contentment on the face; and though they may wander in admiration over the perfect form and figure, they always return to that which is the true attraction—the face. This it is which lingers in our memory; this we never forget, even when our eyes wander away from it for a moment. This is the picture; the rest is but accessory. What care we whether the background be well or ill-defined? We only see this as a framework to the picture. It is *of* the picture, but it is not *the picture*. Does it not follow, then, that this is what we have to consider when we try and picture her. The face must be all in all. The rest, being but accessory, must be

kept down; so that in the picture, as in life, our attention is riveted on the face, and nothing must detract from this—nothing must withdraw our gaze to that which is of subsidiary importance. The rest is there—the figure, the background—nothing is omitted; but it is judiciously kept down, and all our art is lavished on the face to make it as perfect and true to life as art can make it. This is the truest aim of art, and the only one that can give us a truthful rendering of Nature as she is revealed to us.

Those who wish to learn what can be done in the matter of true centre of focus can do no better than study carefully the works of the great Dutch masters, such as Maas, Wouvermans, Paul Potter, Teniers, and others of this school; and in landscape Ruysdael. But landscape is better, perhaps, studied in the Norwich (English) school, which is really the great system of all true English landscape painters; such as Gainsborough, who was as great in landscape as in portrait painting, and Turner, who without the labor of this school could never have been able to paint those masterpieces of artistic conception.

Examples of all these masters can be seen at the National Gallery, and will repay the most careful study. Though in some senses photography is far easier than painting, yet in other respects it is infinitely more difficult; for a skilful painter can, by the perfection of his coloring, often blind us to defects in drawing. Photography has no such power, and is dependant on perfect drawing of line and form, light and shade, and can gain no help from gorgeous effects and the subtle harmonies of color.

The painter, therefore, having a power which is forbidden to the photographer, it follows that the difficulty of our art is immensely increased; but do not let that discourage us—the greater the difficulty the greater the glory, if we are able to surmount it.

We must always bear in mind this distinction between the painter's and the photographer's art, and by studying his methods learn how we can best attain the object for which both are striving. What is the first lesson that we can learn? Is it not that the painter first puts down what is the *raison d'être*

of his picture, and then carefully works out all the accessories, so that they may be in harmony with the central idea, but never detract from it by being thrust into undue prominence? He will lavish all his skill on that which is the true object of interest, and carefully work in the rest, judiciously keeping down all that is not of main importance, blending the whole into one harmonious picture.

This, then, must be the aim also of the photographer. He must compel his lens to see what he sees, in the spirit of the effect. The principal object must thrust itself on our notice; the rest must be kept down, and yet be in harmony with that which is really the picture. I do not propose in this paper to consider the technical methods best suited to attain this object; each will work in his own way to obtain the desired result; and if only they will bear this first principle always in view, there should be no doubt of their ultimate success in reaching a very high standard of artistic excellence.

The same lesson which a careful study of the works of the old masters teach us, as to the faulty work of the microscopically sharp school, apply with equal force to the fuzzy school. This latter school is of comparatively new growth, and is probably founded on a misconception of the teaching of Dr. Emerson as set forth in "Naturalistic Photography," and his other works on photographic art. The tendency of this school seems to be in avoiding what appears to them offensively sharp, to rush into the opposite extreme, and to render everything so blurred and fuzzy that it is often difficult to discover what their pictures are supposed to represent. Apart from this general indistinctness and fuzziness, they appear to lose sight altogether of the fact that there must be some point of interest in the picture which should hold our attention, and which must be sufficiently distinct to tell its own story. Instead of this the whole picture is degraded to one dead level of monotonous dulness. As it is true that a picture should not be more sharp than the unaided eye of man can see, so it is also certain that it should not represent Nature as she appears only to the man who is losing his powers of vision from old age or disease. Another important point which has escaped

the notice of the pinhole photographers is, that by the use of the pinhole they are throwing away one of the greatest advantages which photography possesses over all other methods of pictorial art—viz., the power of instantly seizing and picturing a momentary phase of Nature, whether of light and shade or motion, or any of those fleeting or momentary changes with which she is continually delighting those who study her wayward moods. Take, for instance, a landscape pure and simple, without any living objects. How is it possible to get a true representation of this in the long exposure necessary with a pinhole? The beauty of the picture is dependent on a truthful rendering of the gradations of light and shade; but as these are ever varying, how is it possible to give a true representation of an ever-changing scene except by the most rapid exposure which the lens will allow? Again, what is a landscape without the skies? and how can this be rendered truthfully save by a most rapid exposure?

I think it is Ruskin who says that rocks, trees, mountains, are the features of landscape; but its expression is from above, Nature smiles or weeps as the atmosphere affects her. Hence the importance of the sky in landscape is paramount—an importance not diminished even when it forms but a small portion of the composition.

Study the works of Constable, and see what careful study he gave to a truthful rendering of the skies in his landscapes; he did not think it waste time to spend entire summers in painting skies from Nature. As he himself says: "It will be difficult to name a class of landscape in which the sky is not the keynote, the standard of scale, and the chief organ of sentiment,—the sky is the source of light in Nature, and governs everything."

In pointing out what appears to me to be amongst the chief objections to the microscopically sharp and the pinhole school, I trust that I have said nothing which may give offence to the followers of either; my endeavor has simply been to try by inducing both to study carefully the works of the great masters to enable them to suit their methods of work to those great lessons which such a study cannot fail to give.

The pinhole school seem to imagine that if they are able to produce a photograph which bears some resemblance to an etching, that they have done great things, and that nothing further need be attempted; but this is taking a very low standard; and if this were all that could be aimed at, it would be hardly worth while pursuing the artistic side of photography. A photographic picture should be a thing distinct, and make no pretentions to be what it is not; it may supplant engraving, but should never aim at being mistaken for an engraving. Each method of pictorial production must stand by itself; the painter, the engraver, the etcher and the photographer must each be judged by the highest standard of excellence attainable in their own particular branch; and though each has much to learn from the other, they are and must always remain separate branches. The photographer may be of immense service to the artist, by enabling him to obtain studies for a picture—studies which require often to be grasped in a moment, to be subsequently transferred to the canvas, and which often are of such a fleeting nature that without the aid of photography it would be impossible to give a sufficiently accurate representation. That the photographer has much to learn from the artist is so self-evident that it requires no argument.

Again, for the reproduction of pictures photography is invaluable; it is the only method which can truly reproduce the individuality of the picture, and in which the artist can see his own handiwork unmarred by a would-be improver; but though this work can be brought to a very high standard of excellence, it must by no means be looked upon as the final aim of photography, though as a means of study it will be found invaluable; for by it we are enabled to reproduce the works of the great masters in black and white, and can study them without being confused by effects which are solely due to color. The great aim must, of course, be to produce original work worthy to be called a picture; and if only the right methods be followed, this should not be a dream of the distant future; but remember that before we attempt to produce works of art, we must first learn the rudiments of art, and understand what is

worth producing, and what is unworthy. To few only is it given to be endowed with the genius of artistic perception; to fewer still with that of artistic conception. There are many who look upon a picture and fail to see Nature; there are many more who gaze upon Nature and fail to see the picture; gems of infinite beauty surround them on every side, but their eyes are not opened, and they see not.

How then can we learn to see these things? Must we not seek light from those who can see already? If only the Camera Club can be induced to take the matter up, and institute evening lectures on the principles of art, they may raise the standard of artistic excellence in photography to a level hitherto undreamt of, and at the same time take their proper place in the van of photographic advance.

Finally, I would say to all, take a proper pride in your work, but temper your pride with a sufficient modesty in estimating your own attainments.

"Trust not yourself, but your defects to know,
Make use of ev'ry friend, and ev'ry foe."

Photographic Quarterly.

INTENSIFICATION AND PERMANENCE.

FROM a lengthy communication received a week or two back from a very old correspondent, we are forced to the conclusion that a good deal of misunderstanding still exists as to the relative permanence of intensified negatives as compared with those that are not so treated, and also as to the real cause of the deterioration when it occurs. We gather from our correspondent's letter that he suspects the stability of the compound forming the image itself; but, if a careful examination be made of a number of negatives that have gone wrong after intensification, it will be found that it is the clear portions which become discolored and "filled up," not the image that has faded.

We have written over and over again on the subject, pointing out that it is upon the careful treatment of the negative previous to intensification, rather than to the actual composition of the final image, that its permanency depends, and for

the benefit of the newer accessions to the ranks of photography we can but review what has been previously said, taking as our text the letter to which reference has been made.

The first question propounded is, "What is the chemistry of mercury bichloride, and strong ammonia? Is the resultant product simply oxide of mercury with excess of alkali, or what is the proper chemical title of the resulting product?" The question as it stands is scarcely one *directly* affecting intensification, though indirectly the reaction alluded to has very much to do with the permanence of the negative. Bichloride of mercury and strong ammonia *ought not to* meet one another in the process of intensification, but it is because through carelessness they unfortunately do that mercurially reinforced images have obtained so doubtful a character.

In order to arrive at the result of mixing solutions of bichloride of mercury and ammonia, it is necessary to glance at the constitution of the former substance. As our chemical readers are aware, it consists of one atom of mercury in combination with two atoms of chlorine, and forms a soluble crystalline salt, to which the names of mercuric chloride, per or bichloride of mercury are given, to show that it contains the largest possible amount of chlorine. Mercurous chloride, subchloride or protochloride of mercury, known also in medicine as "calomel," is another salt containing only half the quantity of chlorine, forms a greyish-white powder, which is readily blackened by a great variety of substances, including the free alkalies. It is produced in a variety of ways, but for our present purpose we need only mention the particular reaction that causes the formation of calomel in conjunction with intensification. If certain metals, amongst which is included silver, be immersed in solution of mercuric chloride, a portion of the chlorine is abstracted from the mercurial salt, and calomel, or mercurous chloride, together with chloride of the new metal, are formed. In like manner, if a solution of an alkali, or an alkaline carbonate, be added to solution of mercuric chloride, a precipitate is at once formed which, at first, is white, but gradually changes through various shades of brown to black. This is the result of two separate reactions, first the reduction

of the mercuric salt with formation of calomel, and, secondly, the further reduction of the latter. The alkali in the first place abstracts a portion of the chlorine, forming alkaline chloride, and subsequently attacks the mercurous chloride first formed, reducing it to the state of oxide; and, as both these reactions may proceed simultaneously, it is questionable whether any definite product is obtainable.

This is the general reaction that occurs when a solution of a fixed alkali, such as soda or potash, is poured upon calomel—the white powder is blackened and converted into mercurous oxide, the chlorine going over to the alkali to form chloride of sodium or potassium. But, if aqueous ammonia be substituted for the fixed alkali, a different change occurs, for the blackened product then consists of a double chloride of mercury and ammonia or chloride of mercurous ammonium (NH_2 Hg Cl), while a small proportion of mercury remains in solution in the excess of alkali. Both these products are readily acted upon by chemical means, but are not subject to change from atmospheric causes; and, so far as the constitution of the negative image is concerned, they may be looked upon as perfectly permanent. If it were the practice to raise gelatine negatives to a red heat, or to submit them for lengthened periods to the action of boiling water, the matter would be different, but, as such treatment, or anything approaching it, is clearly out of the question, the mercurially intensified image, when properly treated, may be accepted as reasonably permanent.

When a solution of mercuric chloride is applied to the surface of a gelatine or other negative, the change occurs first alluded to as one of the means of producing calomel. The metallic silver forming the image abstracts a portion of the chlorine from the bichloride, and is converted into chloride of silver, while the mercuric salt is reduced to the mercurous state. The reaction is made clear in the following equation:—

$$Hg\,Cl_2 + Ag = Hg\,Cl + Ag\,Cl.$$

In the case of a collodion negative, the image is thus converted into one of pearly whiteness, which, although it contains chloride of silver, appears to be totally unaffected by the action of light. With a gelatine negative the same purity of

whiteness is never obtainable, a result that may be possibly due to the formation of compounds with the constituents of the gelatine itself, and partly, also, to the imperfect removal of soluble matters from the film. The presence of a very slight trace of "developing stain," invisible before the application, becomes painfully apparent when the negative has passed through the mercury bath.

The bleached image thus produced consists of a mixture of mercurous with silver chloride, and is next treated, after careful washing, with some solution capable of again decomposing the white compound. A dilute solution of ammonia is that usually employed, and this, as has been shown, converts the mercurial portion of the image into chloride of mercurous ammonium, but its action on the silver portion is not so clear. By some it is held that the silver is reduced to the state of subchloride, while others again deny the existence of such a compound. It appears pretty certain, however, that the chloride of silver does undergo reduction in some form, since the application of a solution of sodium hyposulphite, after intensification, fail to materially reduce the density of the image, as would be the case if the silver chloride remained unchanged. Again, the substitution of an ordinary developing solution of pyro and ammonia for the plain ammonia produces little or no increase of density, which must be the case if it were a question of the reduction of the silver salt.

So much for the more reaction of intensification. Let us now look at the question of permanency. It has been already stated that the products forming the final image are, so far as the treatment they are likely to have to undergo, perfectly permanent, and yet not only has considerable doubt been cast upon the stability of negatives intensified in this manner, but some have gone so far as to utterly condemn mercurial methods as useless and untrustworthy. Facts are stubborn things, and it is therefore very difficult to explain away the very numerous instances of collodion negatives that have stood for years, and yet stand, after having been treated with mercury. The fact is, the question really revolves itself into one of sufficient or insufficient washing, before and after the use of the bichloride solution. It is not of the least use to say, as our

correspondent of the other day says, and as many others have said before him, "I always wash my negatives very carefully;" the washing and the care may have been there, but they have not entered into partnership. It is an easy matter to devote a vast amount of care to giving a great deal of washing in the wrong way, and it is well to bear in mind that the quantity of water that passes over a plate, and the length of time it takes in doing it, are very far from forming the measurement of the thoroughness of the actual washing the plate has received.

Comparing a collodion with a gelatine plate, it is scarcely necessary to remind our readers that "thorough" washing can be performed with the former in a tenth, nay, in a hundredth, of the time required for the latter; and, when mercurial salts—or especially the bichloride—happen to be in question, the proportion may be still further increased, owing to the hardening action of the bichloride and the persistence with which it remains in the "leathery" film.

Now, the result of placing an imperfectly washed plate in the bichloride solution is just this: the pores of the film, if not full of, at least contain some traces of hypo, and its necessary attendant, the double silver salt. By the reaction of these different substances we have possibly formed sulphide of mercury, sulphide and chloride of silver, as well as calomel, while any pyro stain that may remain in the gelatine becomes now permanently fixed there by the peculiar hardening action of the mercury. Is it any wonder, then, that such a plate, if it be spoilt at once, should afterwards show signs of deterioration?

If the insufficiency of washing occur after the use of the bichloride, and before the application of the reducing solution, as is mostly likely to be the case, the result will be that the unremoved bichloride will, in the first place, be reduced to calomel, and subsequently by prolonged contact with the weak alkali to the state of mercurous oxide. Thus the immediate condition of the negative will be dependent upon the strength of the alkaline solution and the period of its application; but, the seeds of injury having been once sown, the doom of that particular plate is sealed. In fact, when any of the alkalies or their carbonates are employed as the reducing agent, an

insoluble compound is formed in the film—in the case of insufficient washing—which it is perfectly impossible to remove afterwards ; and, though it may be scarcely visible at first, it is bound sooner or later to pass through further stages of change, and greatly intensify the harm it does, if it do not altogether ruin the negative.

Our correspondent makes some remarks which we cannot exactly follow, regarding the specially bad results that follow the use of sulphite of soda as the reducing agent. Now, singularly enough, sulphite of soda was introduced as a substitute for the alkalies chiefly because it causes the formation of no insoluble salts. Added directly to a solution of bichloride of mercury, it causes no precipitate, and, while it blackens mercurous chloride, the products of decomposition are perfectly soluble, and so are capable of removal by washing. Thus the great advantage of using sulphite of soda is that, in case of accidental carelessness in the matter of washing in the earlier stages, a final wash of a really genuine character may remove the injurious matter remaining in the film.

From a long and close experience with mercury intensification, we are led to believe that, given a thorough washing at every stage of the production of the negative, the image intensified with mercury will prove as permanent as any. Indeed we have seen negatives in the intensification of which so powerful an agent as sulphide of ammonium following mercury had been used, which were as good five years after treatment as originally. Sulphide of mercury is undoubtedly permanent, too much so, indeed, since it generally forms in those portions of the negatives where it should not be, and is absolutely unremovable by any treatment short of destruction of the negative.

Our correspondent further expresses astonishment at our statement in a leading article on August 14 that silver-intensified negatives were the most permanent of those we had under review, "more especially as mercury figures in most of the formulæ." It may relieve his mind to know that the negatives referred to were intensified with acid pyro and silver alone.—*British Journal of Photography.*

NEW PROCESS FOR TONING BLUE PRINTS.

W. P. JENNY, E. M., PH. D.

THE intense blue color of the ordinary blue print gives unnatural effects in prints from photographic negatives; also in architectural drawings where views and elevations of buildings are reproduced. The following methods of toning such blue prints has been found to be easy of application and to give tones varying from a brilliant blue through violet blue to neutral tint and warm shades of gray, according to the intensity of the action of the bath.

The paper employed may be common blue print paper, sold ready for use in rolls, or the specially made paper sold in packages of cut sheets by the dealers in photographic supplies. The solar printing is carried out in the usual manner. The best results are obtained with dark prints, as the intensity of the color is somewhat reduced by the toning process. The following baths are employed:

Bath A.

Muriatic (hydrochloric) acid	3 to 4 drops.
Water	16 oz. (1 pint).

Bath B.

Aqua ammonia	5 to 10 drops.
Water	16 oz. (1 pint).

Bath C. Apoth. weight.

Alum	2 oz.
Tannic acid	1 drachm.
Water	16 oz. (1 pint).

The prints are immersed face downward in bath A until all soluble salts contained in the paper are dissolved and removed, then dipped into bath B until the negative turns a violet blue and the whites are clear, care being taken that the immersion in the ammonia be not continued too long, as the definition of the picture may be injured. The prints are transferred from the ammonia bath, placed face upwards in a tray filled with bath C, and exposed to bright sunshine for from 5 to 10 minutes, until no increase in the strength of the picture can be

noticed. The pictures are finished by toning in bath B until the desired shade of color is obtained, the picture becoming first a brilliant blue, then violet, and finally, by prolonged action, bluish gray or neutral tint. The toning may be varied by a second immersion in the tannic acid bath C, followed by a second toning in bath B. After toning, the prints are dried in the sunlight in the usual manner.

The above process is specially applicable to prints from photographic negatives, enabling the amateur in the field, provided with a printing frame, some sheets of prepared blue print paper, and the above easily procured chemicals, to test the printing quality of his negative with results only slightly inferior in detail and definition to those obtained by the complicated process of silver printing.—*Scientific American.*

Fixed Focus.—We wish to protest strongly against the growing use of the term "fixed focus," as applied to photographic lenses. The expression is misleading in the extreme. There is only one focus in the strict sense of the word, and that is the equivalent focus, or focus of parallel rays. The back focus in the case of double combination lenses, is often quoted, but that is outside the present subject.

At least three-fourths of the users of "fixed focus" lenses, if asked to define the term "fixed focus" would be unable to give a satisfactory reply. But it is usually the loosest expressions, as long as they are convenient, that are taken up with parrot-like pertinacity by the photographer. We are sorry to find, not only dealers, but some of the most reputable makers of photographic lenses, leading the bad example by importing the objectionable term into their catalogues.

We are left to conjecture the meaning to be conveyed by the expression "fixed focus," is that both near and distant objects will be equally well defined at a given conjugate, and with a given diaphragm aperture. That is to say, it is convenient on the part of the maker or dealer to assume that it is so, but it must be apparent to any one who has studied the matter that such a condition in photographic optics is absolutely impossible. It is, after all, the stop in the lens that governs the defining power at a given distance, assuming, of course, that the equivalent focus is determined as it must be, owing to the limit of size in plate. Then why not use the term "fixed aperture," or, better still, "fixed intensity?"—*The Optician.*

Editorial.

More Photographic Jurisprudence.—The curious question respecting the right of the photographer to keep open his show-case on Sunday has again arisen in Germany. The question being, has a photographer the right to expose specimens of his work to public view on Sunday?

It rather surprises us that this question should be broached in Germany, which is generally accredited with being one of the most liberal countries, so far as goes the construction of the Sunday laws. Had this question arisen in one of our own western towns, it would have elicited but little surprise, if we mistake not the same question i. e. the exposure of goods and merchandise on Sunday, in past years was agitated in some of the larger seaboard cities in the country, but we are not aware of a test case having ever been made. The universal custom, however, is that most of the show cases remain exposed, being merely covered by a wire grating, but where bulk or show windows are used the curtains as usually drawn. Of course the present question has nothing to do with the pernicious system of Sunday gallery work, but merely with the exposure of photographs in permanent show-cases on the first day of the week.

It seems that the first case of this kind in Germany to reach the higher Court of Appeals or *Kammer gericht* dates as far back as December 10, 1869, wherein the lower court which had imposed a fine upon the offending photographer was reversed, the decisions being based upon the fact that the specimens exposed were merely specimens of skilful handicraft, and not samples of saleable or commercial photographs.

In accordance with the decision the lower courts governed themselves accordingly, and in every similar case their verdict brought acquittal to the accused photographer.

Eight years later (1887) the same court for some reason reversed itself and it is this new construction that causes more or less trouble to the craft. The case in point being that of Photographer Einsle of Neuwied, who was sentenced and fined for exposing his specimen photographs to the public view on Sundays.

The *Photographische Nachrichten* (No. 29, pp. 463) in commenting upon the reversal of the court states that it is more than probable that orders have been issued to local police boards, based upon this verdict to proceed against all offending photographers.

Systematic Photography in Bohemia.—According to a notice in "Politik," the leading photographic club in Prague "Club Fotografu Amatéru v. Praze" have arranged a congress of the various amateur photographic societies within the Bohemian realm; the object of this meeting was to encourage a systematic effort to secure negatives of the various historic monuments and landmarks of the Bohemian nation, including noted landscapes and the peculiar local customs and unique costumes of the Bohemian peasantry. The results of this movement are to be exhibited at an exhibition to be held during the coming year.

A Mammoth Group.—The Photographische Wochenblatt No. 31 contains a process cut of a most remarkable composite photograph, which is probably the largest group picture ever constructed. The size of the original being about 56 feet by 37 feet, this was made under the supervision of Herr F. Surand, of Ebling, and necessitated the making of about 400 negatives. A stretcher was then made the size of the finished picture, and the 400 portraits and groups were arranged by the artist just as they were to appear in the picture, the prints were then lightly tacked or basted on the canvas, when the artist sketched in the background and scenery; after this was finished duplicated photographs were carefully cut out and placed in position upon the permanent canvas, which was made of extra heavy muslin coated with heavy white paper from a continuous roll. The transfer was made entirely by quadrature, and represents over two months exacting and troublesome labor. After the photographs were all cut out, jointed and pasted in position, the whole surface had to be coated with a gelatine film, to act as a carrier for the oil colors to be used in painting in the scenery; here a new difficulty presented itself. In case the coating was uneven or the gelatine set before the film was uniform all of the expended labor would be wasted and the photographs ruined; to overcome this dilemma, a 5 per cent solution of gelatine was prepared and poured on the surface from four different points simultaneously, and quickly spread over the great surface by as many assistants with broad brushes; the attempt proved a complete success.

When thoroughly set, the artists commenced their part of the task, using oil colors thinned down with benzine, so that the color would dry before it could sink into the paper.

The photographs were all on Algëin paper, and remarkably soft and clear.

The picture is in possession of Messrs Losser & Wolf in Berlin. The price paid for this great group was 5000 marks or about $1000.

Our Illustration.—"Five O'clock Tea,"—an exceedingly happy Blitz-Pulver effect, is a toned Bromide on the Buffalo Argentic Company's paper, printed with the Hoover Rapid Printing Machine. The negative was made by Wm. L. Soleau, Garrett Park, Md., upon a rapid plate with Beck lens, 8 inch focus. Development, pyro and soda.

THE NEW HOME OF THE PHILADELPHIA PHOTOGRAPHIC SOCIETY.

ON Wednesday, October 21st, the first meeting of the Philadelphia Photographic Society, was held in their new quarters in the Fuller Building, on 18th street below Market. These consist of two rooms on the second floor, which are approached by an easy stairway. The larger room 53x67 feet will be utilized for general meeting purposes, lantern exhibitions and displays of prints, etc., while the smaller corner room 16x47 feet, facing on 18th street will be used as a library and reading room.

It is proposed to partition off a portion of the large room to be fitted up as a complete working department, with dark rooms, enlarging and reducing apparatus, printing facilities, lockers for chemicals, etc., in fact including every requisite for the practical exemplification of all branches of the various photographic processes.

The rooms are amply lighted and will be heated by steam. It is claimed that these two rooms are the largest, and when fully equipped, will surpass those of any similar society in the country, for convenience and utility.

As yet there remains much to be done, which it is estimated will entail an expense of over $1500—to meet which the Board has asked voluntary subscriptions from the members. Blank forms were provided and sent to the members, with a result both gratifying and encouraging as announced by the treasurer, viz.: $837.00.

At the late meeting, Mr. Cameron Swan, of the Annan & Swan Photogravure Company, London, was introduced by Mr. Frederick E. Ives, and half a dozen specimen prints were shown, which it was stated had been produced without the use of the graver. Mr. Swan's father is the inventor of the well-known Autotype Carbon process, so much used by Braun of Dornach, for the reproduction of paintings.

The members present expressed themselves well satisfied with the new quarters, and seem to feel that if the plans of the Board are carried out, the advantages offered by their use would add much to extending the object of the Society.

Photographic Scissors and Paste.

Photographs as an Electioneering Device.—The late general election in New South Wales is going to furnish us with a leading case in the law of photographers' responsibility. A certain candidate ordered 1,500 photographs of himself, and gave instructions to have them posted to every elector on the roll. Notwithstanding this clever electioneering device, he was at the bottom of the poll. He swears the photographer was to blame, and declines to pay his bill. So litigation has commenced. The defence appears to be that the original specimen photograph was all right, but in the process of multiplication of copies the mouth somehow got blurred in such a way as to give what is described as "a Satanic leer" to the whole countenance. The defendant declares with the utmost confidence that there is not the slightest suggestion of "a Satanic leer" about his physiognomy, and therefore, instead of the photographer suing him, he holds that he ought to sue the photographer for constructive libel, resulting in the loss of the election and other consequential annoyances.—*Exchange.*

An Amateur's Adventure.—A short time ago an ardent amateur in England set forth with his camera, intending to take an instantaneous picture of the yacht race off Fort Matilda Greenock. Finding that big gun practice was going on at the fort, he thought he would try and catch one of the guns going off. Accordingly he rigged up his camera and proceded to focus. Upon this a non-commissioned officer called to him to "go out o' that." As he was about a couple of feet inside the gate, he at once moved outside, and was again about to proceed to focus when the officer came out and demanded his name and address. The amateur declined to give them and asked why he wished them. The officer threatened to call out an escort and have him arrested if he did not give him the desired information. The amateur declined to comply unless he was first told what use was to be made of it. He was then told for the first time that it was against the law to photograph any fort or war building, and as he had been attempting to do so, his name and address must be given. Upon hearing this the desired information was at once given, and no further attempt made to photograph. The man of the camera has now received a letter from the officer-in-charge, stating that the matter has been reported to him, and informing him photographers are not allowed to take photographs of

forts and other war department establishments, and any person found doing so, after being cautioned, is liable to be handed over to the police.
—*Photography.*

A Mean Trick.—Hostetter McGinnis has been paying his addresses, for some time past to Miss Esmarelda Longcoffin. She had not given him the slighest encouragement, and he was about to commit suicide, when she threw him into a spasm of delight by asking him if he would do her the favor of giving her his photograph. He happened to have one with him, and he begged her to accept it, saying that it was the happiest moment of his life, etc. As soon as he was gone, the young lady called her servant and giving her the photograph said: "Whenever anybody, who looks like that, comes to the door, tell him I'm not at home."—*Texas Siftings.*

Alvin G. Clark & Co.—The dissolution is announced of the partnership, extending over nearly fifty years, between Alvan G. and George B. Clark, the famous telescope makers of this city. The business will be continued by Alvin Clark.

Debit and Credit.—It has been estimated that the change in the mode of hair-dressing by the German Emperor growing a full beard, has caused a loss to the Berlin photographers alone, amounting to over $50,000, by relegating all the old photographs on hand of the Emperor to the waste basket. The loss of the dealers in engravings and busts is stated to be still heavier.

Detective Photography.—Photography, says the *Pall Mall Gazette* in a recent issue, will for the next fortnight be in possession at the Old Water Color Society in Pall Mall East. The exhibition just opened is that of the Photographic Society of Great Britain.

To many the most fascinating prints in the show will be those exhibited by a German expert in photo-micrography, Dr. P. Jeserich. Among these are some showing the roots and the splitting of human hairs, which barbers warn us of, and a few spectrographs of pure and impure blood. Besides these there are a number of illustrations of detection of forgery by photography, including alterations of figures upon checks, postmarks, etc.

Dr. Henry Crew, Professor of Physics, at Haverford College, Pa., has resigned his charge and accepted a position at Lick Observatory. Professor Crew who is an expert photographer will devote much of his time to Stellar photography.

Photographic Hints and Formulæ.

Cleaning Stained Fingers.—The brown stain on the fingers which generally accompanies development with pyro may be removed by washing the hands in a strong solution of chloride of lime, and then repeating the operation in a dilute solution of citric acid; or, better still, by rubbing the stained part with a crystal of the acid.—*The Beacon.*

Intensification for Mechanical Processes.—A formula for intensifying wet plate negatives for photo-mechanical work, which works excellently, is as follows:

A.

Bromide of Potassium,	¼ ounce.
Water,	4 ounces.

B.

Sulphate of Copper,	½ ounce.
Water,	4 ounces.

Mix equal proportions of A and B, and flow on the plate till thoroughly whitened. Blacken with nitrate of silver, 30 grains to the ounce, or by hydrosulphite of ammonia 1, water 4 parts.

Pyro-Eikonogen Developer.—A correspondent in the *Deutsche Photographen Zeitung*, No. 39, commenting upon the difficulty experienced in obtaining the requisite density in developing plates of extra rapidity, states that the addition of a small percentage of an alcoholic solution of pyrogallic acid to the eikonogen developer overcomes the difficulty, without retarding the rapid action usual to eikonogen. The formulæ given is as follows, viz.:—

I.

Water distilled,	1500 ccm.
Sulphite of soda,	160 "
Eikonogen,	20 "
Citric acid,	20 "

II.

Water,	1000 ccm.
Carbonate of soda,	320 "
Carbonate of potash,	160 "

III.

Alcohol,	100 ccm.
Pyro,	10 gram.

For use, I. 3 parts; II. 1 part; III. add 5 ccm. to every 100 ccm. of developer.

Temperature of working solution should be about 70° to obtain best results.

Platinum Toning.—The divers formulæ for toning silver prints have, up to the present time, been objectionable on account of giving a bath of but little permanence. Now the chloride of sodium gives stability to the chloro-platinites, used in toning yields good results, as practice has shown. In consequence I was led to compose the following formula:

Chloro-platinite of soda,	2 grammes.
Chloride of sodium,	2 "
Bitartrate of soda,	1 "

Dissolve cold in one litre of distilled water. The bitartrate of soda added to the present formula serves to render the bath slightly acid; toning cannot be obtained in alkaline baths. A bath thus prepared keeps for a long time without decomposition, and gives very beautiful tones. To make use of it, it suffices to plunge the prints, previously separated, in water. First we obtain tones that are purple, brown-purple, brown and finally of the brilliant black of India ink. The print should be removed as soon as it reaches the point of the tone desired, as in drying it becomes darker. If it were allowed to remain too long a time in the bath, it would become grey, dull, and without relief. Coming from the toning bath, place in a bath of hyposulphite of soda at twenty per cent. followed by abundant washings. Once dry, the print is unchangeable, and has a black tone of a most beautiful effect. Landscapes toned by this process are especially beautiful. This toning succeeds with all the sensitive papers furnished by dealers: albumenized, salted, etc.—*Photo Gazette.*

Home-made Hand-Grenades.—Any one can make the hand-grenade fire extinguishers, and at a small fraction of the prices charged in the market. Any light quart bottle will serve to hold the solution, which is composed of one pound of common salt, one-half pound of sal-ammoniac, dissolved in about two quarts of water.—*Pittsburgh Dispatch.*

In the Twilight Hour.

"IT is a duty to make the best possible use of all we have, and to make ourselves and our surroundings just as good, beautiful and joy-giving as we know how. Self-martyrdom is not an essential ingredient in being and doing good."

"A good part of faith, to say the least, is courage."

A MORAL CODE.—"Avoid factions. Work hard. Avoid listening to slander. Practice self-denial. Learn undeviating steadiness of purpose and endurance of misfortune. Tolerate the ignorant. Be benevolent of heart, and learn to receive favors without being humbled by them. Learn delicacy in correcting others. Write with simplicity. Be accurate. Be easily pacified."—*Marcus Aurelius.*

"RELIGION is before morality as life is before organism. Organism does not produce life, but is produced by life; so morality does not make a man religious, but religion makes him moral."—*Evangelical Messenger.*

"I pray Thee, O God, that I may be beautiful within."—*Socrates.*

"MEN do not make occasions, but occasions make men. Occasions give men an opportunity to show themselves at their fullest and best; but, unless the occasion is a reality by itself, it cannot be made an opportunity for the wisest and ablest of men to exhibit his exceptional powers. He who wants to make his mark in the world has reason to rejoice that everything seems against him in the line of his endeavors."

"HE is the hope of the nineteenth century, as He was the hope of the first. He was the founder of Christianity, and He, until time is over, will be its preserver. He it is to whom you must come, by purity and humility, and He will give you true faith and a guide upon the mountains to lead and instruct you, for 'He is the way, the truth and the life.'"—*Archbishop Ryan.*

"THE sun lightens the world by its own glorious brightness, so we cannot be full of cheerfulness, goodness and good sense without others being the better for it. Nor can we have a charming home, with everything in and about it controlled by an enlightened intelligence, but the influence of a good example will be felt by all the neighbors over the way."—*The Phrenological Journal.*

"A natural inclination makes us require that things that are advantageous to us should be done quickly. This, however, we should repress in order to accustom ourselves to the practice of holy indifference, and leave to God the care of manifesting His will, being assured that when God wishes an affair to succeed, delays will not injure it, and that the less industry there is on our part, the more there will be of the wisdom and power of God."—*St. Vincent de Paul.*

"VIRTUE is the flower and fruit, the culmination, the completion, the crown of human nature at its best and highest."—*Bishop Doane.*

Die Photographische Objective, ihre eigenschaften und prüfung, by Dr. J. M. Eder, published by William Knapp, Halle a./S. The fourth part of Dr. Eder's "*Ausführliches Handbuch der Photographie,*" being the first part of the second half of Vol. I. This part commences with an introductory chapter on photographic optics by Dr. Adolf Steinheil of Munich, in which he treats upon various forms and materials of photographic lenses in addition to the optical formulæ of their action and construction. The second chapter is a historical review of the camera and the photographic objective by Dr. Eder. In the succeeding chapter the learned author describes all the various makes of lenses with a critical analysis of their uses and capabilities. The work is embellished with portraits of Dr. A. Steinheil, Fr. von Voigtländer and the late Joseph Petzval, in addition to the 197 wood cuts in the text. We expect to have more to say about this work in a future number, and recommend it to all of our readers who are conversant with the German tongue.

RECENT PATENTS.

ISSUE OF SEPTEMBER 29TH, 1891.

460,264—Envelope for Photographs, etc.; H. C. Lavette, Chicago, Ill.
460,337—Photographers, Flash-torch for; M. R. Hemperley, Philadelphia, Penna.
460,417—Solar Camera; E. T. Wilson, Stillwater, Minn.

ISSUE OF OCTOBER 6TH, 1891.

460,672—Camera-roll-holder register; H. C. Boyer, Philadelphia, Pa.
460,570—Photographic Films, Manufacturer of; B. J. Edwards, London, England.
460,621—Photographs; Giving a matte surface to albumenized-silver-paper; J. D. Wrigglesworth and F. C. Binns, Wellington, New Zealand.
460,663—Picture mat; J. Searvogle, Rochester, N. Y.

DESIGN PATENTS.

21,096—Photographic Card; C. A. Wright, Philadelphia, Pa.

ISSUE OF OCTOBER 13TH, 1891.

No issues October 13th, 1891.

ISSUE OF OCTOBER 20TH, 1891.

461,609—Photographic Objective; E. Gundlach, Rochester, N. Y.

ISSUE OF OCTOBER 27TH, 1891.

461,905—Photographic Camera; J. H. Hare and B. P. Johnson, Brooklyn, N. Y., assignors to E. & H. T. Anthon, New York City.
462,110—Photographic Films; Means for holding and carrying, E. E. Ellis and A. L. Lehnkering, Rochester, N. Y.
461,910—Photographic Shutter; E. B. Barker, Newark, N. J., assignor to E. & H. T. Anthony Co., New York, N. Y.

THE SIXTIETH Exhibition of the American Institute opened in New York, September 30th and closes November 28th, 1891. The exhibition can be reached by way of Second and Third Avenues to Sixty-fourth Street; we expect to give an extended account of the exhibits relating to the photographic department in a future number.